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IS : 6519 - 1971  
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## *Indian Standard*

# CODE OF PRACTICE FOR SELECTION, CARE AND REPAIR OF SAFETY FOOTWEAR

(Second Reprint AUGUST 1992)

UDC 685.314.3:614.897.2

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BUREAU OF INDIAN STANDARDS  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

# Indian Standard

## CODE OF PRACTICE FOR SELECTION, CARE AND REPAIR OF SAFETY FOOTWEAR

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# Indian Standard

## CODE OF PRACTICE FOR SELECTION, CARE AND REPAIR OF SAFETY FOOTWEAR

### 0. FOREWORD

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 27 November 1971, after the draft finalized by the Footwear Sectional Committee had been approved by the Chemical Division Council.

**0.2** Safety footwear are generally used by miners and workers engaged in heavy metal industry to protect their feet against occupational hazards. These footwear are carefully designed, keeping in view the various hazards which a particular job may involve and sturdily constructed to meet the requirements of the various types of mines, and different categories of workers. The material requirements and the constructional details of the various types of safety footwear have been covered in IS : 1989-1967\*, IS : 3737-1966†, IS : 3976-1967‡ and IS : 4128-1967§. Improper selection, care and maintenance of these footwear causes discomfort and makes them unserviceable after some time and fail to serve the special purpose for which they are meant. This standard has been prepared to provide a suitable guide for maintenance of these footwear.

**0.3** The repair procedures suggested are suitable for leather safety footwear with leather sole or with moulded rubber sole and heel and are not applicable for rubber-canvas footwear. For maintenance of canvas rubber safety boots, procedure described in material specifications should be followed; these safety boots should not be repaired.

### 1. SCOPE

**1.1** This standard prescribes a code for selection, care and repair of safety footwear.

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\*Specification for miners safety leather boots and shoes (*first revision*).

†Specification for leather safety boots for workers in heavy metal industries.

‡Specification for safety rubber-canvas boots for miners.

§Specification for fireman's leather boots.

## 2. TERMINOLOGY

**2.1** For the purpose of this standard, definitions given in IS : 2050-1967\* shall apply.

## 3. SELECTION

**3.1** Safety footwear are available in different sizes and fittings (*see* IS : 1638-1970†). Each person should be fitted with footwear of proper size and fittings.

**3.2** Foot measuring devices should be used; a simple form of a device is shown in Fig. 1. In cases where no foot measuring device is available, the measurement of width and length of the foot should be taken by the shoe measuring tape with the weight of the body falling on both the feet uniformly.

**3.3** Girth measurement of the joints should also be taken with the help of a measuring tape while standing, when the foot is under normal pressure of the body.

**3.4** After ascertaining the size and fitting, footwear should be tried on the wearer to ensure proper fit and comfort. Only properly fitted footwear should be issued to individual worker.

NOTE — The foot and last measurements differ and so it would be necessary to provide footwear having two size up than the actual foot measurement.

## 4. CARE

### 4.1 Cleaning and Dressing

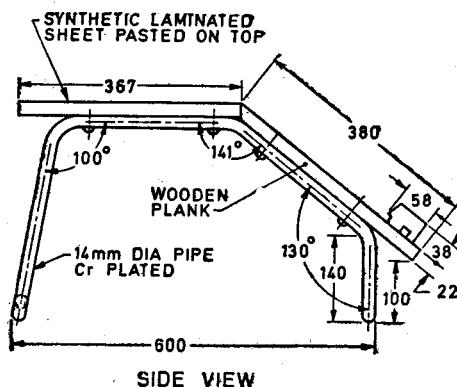
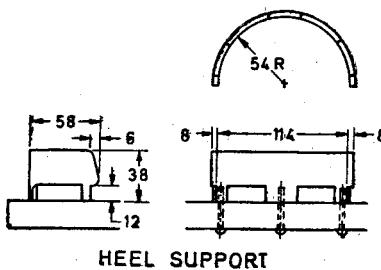
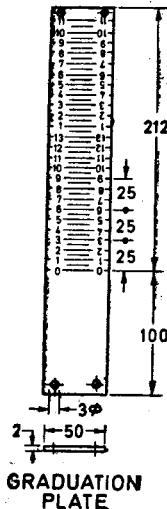
**4.1.1 Personal** — Footwear should always be kept as clean as possible. After every wear if the footwear are soiled with mud and dirt, they should be cleaned with soap and dried (*see* 4.2). Cold soapy water generally removes most of the dirt. Footwear with russet, retanned or similar leather upper should be treated with animal or vegetable oils, grease or shoe compound oils at least once a week to help preserving the quality of the leather and to render the leather more water repellent, soft and pliable. Rubber canvas footwear should be cleaned by damp cloth everyday after use to remove adhering dirt. Footwear with leather upper should be regularly cleaned and polished with shoe polish (*see* IS : 1648-1964‡).

**4.1.2 Institutional** — A suitable revolving brushing device shown in Fig. 2 should be used for proper cleaning of the footwear. At the end of

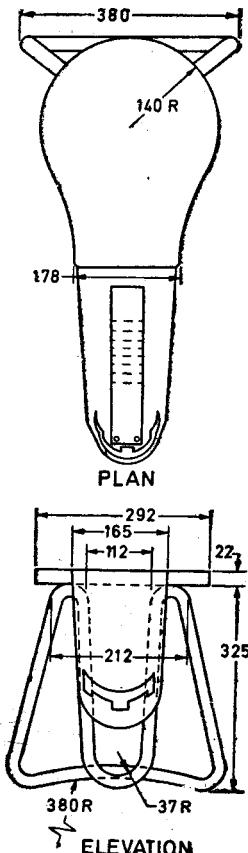
\*Glossary of footwear terms.

†Specification for sizes and fittings of footwear (*revised*).

‡Specification for shoe polish.



All dimensions in millimetres.  
**FIG. 1 SHOE FITTER'S TABLE**



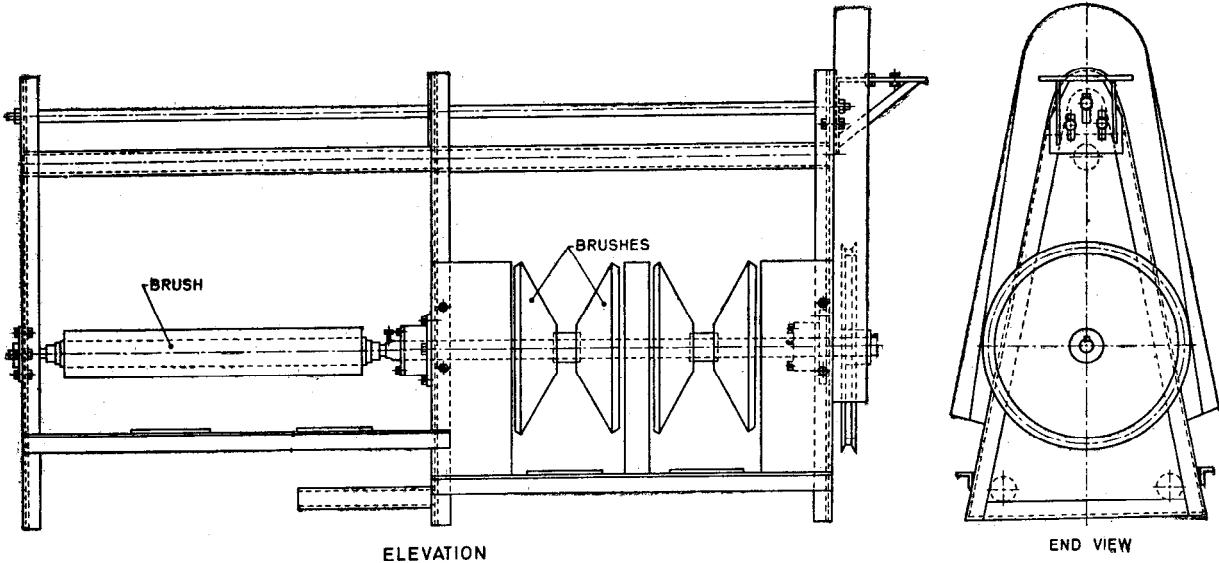


FIG. 2 SCHEMATIC DIAGRAM OF BOOT-POLISHING MACHINE

every shift or after every use, the footwear should first be put to the first brush ( cylindro-conical in shape ) of the device, to clean out all the dirt. Then the footwear should be placed on the second brush ( which is cylindrical in shape ) for drying.

**4.1.2.1** For cleaning the footwear with rubberized canvas upper a small water spray arrangement may be provided near the brushing machines so that the boots could be drenched in water and cleaned by the first brush. The boot should then be presented to the second brush where the boots may be dried. Wherever possible, an air jet should be provided after the second brush under which the boots could be thoroughly dried. The air jet should be operated from a compressor.

**4.2 Preservation of Leather** — Leather, specially upper, shall be preserved well and rendered more water repellent by treating them with castor oil, soyabean oil, shoe dubbin or neat's foot oil. Leather absorbs castor oil, soyabean oil slowly, so the footwear should be left overnight before it is re worn. Heavy coating should always be avoided. Frequent rubbing with light coat of the above treatment should be preferred.

**4.2.1 Preservation of Sole Leather** — This may also be made more water repellent by treating them with a mixture of the following composition:

Suitable mineral oils ( free from lubricating additives commonly added for motor oils )	4 parts
Beeswax ( conforming to IS : 1504-1968* )	1 part
Paraffin wax	1 part
Rosin ( conforming to IS : 553-1969† )	½ part

The mixture should be not enough for the hand to touch. Footwear should be placed in the mixture for 15 minutes in such a way that the entire leather sole from outside goes with in the mixture. The mixture should also be rubbed on upper leather and cleaned.

**4.2.1.1** Alternatively, the following preparations of dubbin may be used for preservation of upper leather:

a) Beeswax ( conforming to IS : 1504-1968* )	25 parts
Castor oil ( conforming to IS : 435-1966‡ )	75 parts
Phenol ( as a preservative )	1 part
b) Tallow	75 parts
Cottonseed, neem or pungum oil	25 parts

\*Specification for commercial beeswax (*first revision*).

†Specification for rosin ( gum rosin ) (*first revision*).

‡Specification for castor oil (*revised*).

**4.3 Drying of Leather Footwear**—Leather footwear are liable to become wet from various sources, mainly foot perspiration, water in the mines and rain-water. Footwear after being wet should be thoroughly dried before re-use.

**4.3.1** Drying should always be done away from direct heat, for example, fire or open sun. Such direct drying hardens and shrinks the leather, making the footwear very uncomfortable to the wearer. It also reduces the life of the footwear.

**4.3.2** To avoid undue deformity in shape during drying, the footwear should always be dried with a shoe-tree on. In the event of shoe-trees not being available the footwear should be stuffed with crumpled newspaper. The stuffing should be done in such a way that there is no room for the upper leather to shrink due to loose stuffing. This practice would help the footwear to retain its shape and would also absorb the moisture from inside. The counters, toes, and the heel of the footwear if deformed by water or moisture, should be brought as near as possible to the original shape.

## 5. REPAIR

**5.0 General**—Repair to any damaged or worn out component should be made immediately in order to obtain the maximum amount of service from the footwear, because the longer they are neglected the more difficult it becomes to repair them properly. Neglect to keep the sole in good condition specially at toe and heel shall lower the safety factor of the footwear. Prior to undertaking any repair, the footwear should be examined by a competent examiner and a decision made, based on the defects as to whether it is repairable. Some of the defects are given below:

Defect	Repairable	
	Yes	No
Worn out, thin or cracked outsoles	✓	—
Missing or badly worn ( more than heels )	✓	—
Loose or torn welt	✓	—
Damaged shank	✓	—
Upper stitching ripped or torn	✓	—
Missing or damaged eyelets	✓	—
Broken or loose sole stitches	✓	—
Worn, thin or cracked slip soles or middle soles	✓	—

Defect	Repairable	
	Yes	No
Worn or cracked quarter linings at back of shoe	✓	—
Torn or missing tongues in low quarter shoes	✓	—
Missing of loose heel pads	✓	—
Insoles with slightly uneven, 'lumpy' or curled edges	✓	—
Insoles that are badly cracked, dried out or guttered	—	✓
Torn or broken insole shoulder	—	✓
Badly torn or worn out vamp linings	—	✓
Torn or missing tongues in, ankle boots	—	✓
Badly cracked or holed uppers	—	✓
Heel plates	✓	—
Toe plates	✓	—
Tip filling	✓	—

All material to be used for repairing should conform to the original requirements prescribed in the relevant standard.

## 5.1 Repair of Sole

**5.1.0** Prior to carrying out repairs to the outersole, the correct size of last on which the footwear was made, should be inserted into the footwear. The last should not be removed until the edge setting and finishing operations are completed.

**5.1.1** Leather halfsoles and heels should never be used in dry condition and should be mellowed before use. This should be done by soaking the leather for half an hour on the day previous to use. After soaking the leather should be allowed to drain for about ten minutes, wrapped in moist gunny bags and kept in a cool place. The following day, the sole and heels should be placed grain to grain and should be hammered in pairs starting from the centre and working round to the outside edges. This operation reduces the substance slightly but helps in the following respects:

- It makes the leather easier to work.
- It permits the new sole and heel to be bedded down without violent hammering.

- c) The leather will be more wet resisting. The pores and fibres are tightened and water is therefore not so readily absorbed.
- d) Considerably longer wear results.

**5.1.2** When removing the worn out sole sufficient care should be taken to ensure that no damage is done to the foundation of the footwear. Studs and tips should first be removed and then the stitches round the fore part carefully cut. The screws should be cut out after removing the soles without hammering down. The screws should be cut off close to the remaining sole. The worn out sole should then be stripped or pulled away from the footwear from the toe up to the joint and cut off 30 mm behind the joint. Half sole should be executed with a straight graft. The new half sole should never be countersunk. Countersunking new half sole would considerably weaken the footwear waist.

As such this practice should be avoided. The graft or the joint of old and new half sole should be made by skiving both the edges at the same angle to make the splice not less than 35 mm wide from the joint. The thinner part of the new sole should be skived down to 3 mm. After preparation of the graft the half sole should be attached at the waist first by 15-mm rivets which should be placed 5 mm away from the edge. The rivets should be placed 6 mm apart. The sole should then be slicked forward and moulded to the bottom of the footwear and then temporarily attached by 2 rivets at the toe. The extended edges of the new sole should then be trimmed all round the edges of the middle sole. Riveting round the fore part should then be done and the rivets should be driven slightly at an angle which should be placed 10 mm away from the outside edge and not more than 12 mm apart. The sole edge should then finally be trimmed and should be rasped to conform to the shape of the boot and finally smoothed with a blunt knife.

## **5.2 Repair of Heel**

**5.2.0** The heel being the portion which wears out most frequently. It should always be kept flat and worn out portions should be repaired. The worn out heel not only causes the foot out of balance causing undue strain on the footwear, the foot muscles and the arches but actually endangers the wearer by improper body balance.

**5.2.1** Worn out lifts on the heel should be removed first so that the heel should be rebuilt again by attaching the lifts successively. The nails or heel pins sticking out after removing the lifts should not be hammered down. Those should be cut off close to the remaining lifts of the heel.

**5.2.2** In case the footwear require a new heel, heels should be solidly built up. Care should be taken to see that the heels are kept to the original height otherwise the pitch of the footwear will be destroyed. In case of footwear requiring replacement of only the top piece, a solid

top piece should be used. After having attached the top piece, the extended portion of the leather should be removed and the edges finished in the same manner as done in case of soles.

### **5.3 Repair of Upper**

**5.3.1** Missing and loose eyelets should be replaced and care should be taken that the newly fitted eyelets are properly clenched.

**5.3.2** Care should be taken to repair any break in upper seams. Back straps requiring repair should first have the back seams restitched, if necessary. Tears or bad cracks in uppers should be patched up at an early stage and tongues replaced as soon as necessary.

**5.4 Minor Repair** — Small or similar damages in the upper should be repaired at an early stage before they develop into major defects. All patches used for the job should be skived on the edges before being attached. Threads should be thoroughly waxed before use to ensure maximum strength.

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